Artefact 'Scripts' and The Performer-Developer

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Abstract

This paper outlines the methodological and theoretical considerations encountered in the practice-based research of a performer-developer. Considering the relevance of self-reflective and autoethnographic methods for practice-based, creative-production research projects, the relationship between development and use of technological artefacts for musical performance is discussed with reference to relevant theory.

Practice-based research projects in the digital arts have much to contribute by examining the process of artefact development itself, in addition to the presentation and evaluation of technological artefacts. The connection of emergent artistic and performance practices to established theory enables the researcher to use creative practice as a way to ask questions about the domain of practice and to understand any answers in relation to existing bodies of theoretical knowledge. As a performer-developer, my creative practice involves programming and performing with my own software artefacts, with a specific focus upon the exploration of interactivity and autonomy in human-machine musical improvisation. My research is focused upon the way in which software design and use are intertwined in this type of practice, and how both contexts help to define modes of performance practice and theoretical understandings of designing for interactive performance. This research makes use of self-reflexive and autoethnographic methods to open up the process of design, development and use of these systems. Such an approach strives to understand both the practical and theoretical significance of the emergent creative practices of interactive system design and performance from a practitioner's perspective. This paper outlines the current methodological and theoretical considerations of my research; however, the conceptualisations outlined below do not purport to be exhaustive.

Problem-Solving vs. Creative-Production

Stephen Scrivener has suggested that, although much practice-based research centres upon the creation of artefacts, there exist fundamental differences between artefacts developed to solve well-defined research problems and those projects focused upon creative production that use practice as a vehicle for exploring complex research themes [1]. Scrivener distinguishes between traditionally understood *problem-solving* research projects and what he terms *creative-production* projects typical of practice-based research. According to Scrivener, artefacts developed in *problem-solving* research projects are presented as either novel artefacts posited to solve well-defined problems or as improvements upon already existing artefacts [1]. By contrast, *creative-production* research projects are often concerned with the generation of artefacts as a means to investigate, explore and define research problems as well as to solve them. Problems arise through the practice of artefact creation, and research themes are developed and explored through subsequent moves in practice. As such, the process of artefact development remains the main research focus, and the explication of the process of design and development therefore forms an integral part of the project's contribution to new knowledge [1].

My current research approach resonates with this description of creative-production research. The _derivations_ interactive performance system is the central creative artefact that has emerged from a self-reflexive, practice-based approach to creative practice research. _derivations_ is an interactive performance system for improvised human-machine performance, designed for use by improvising instrumentalists (see [2] for full system details). The kind of development that led to _derivations_ is creative and exploratory, with the development process acting as a site for investigating new forms of interactivity as opposed to searching for the optimal solution to a design problem.

In line with Scrivener's definition of creative-production research, the process of development in this research has therefore been less concerned with *problem-solving* than with *problem-posing*. Through a cyclical process of design and development, performance and reflection, specific research themes and questions have emerged from my practice. By tracing links between various sources of autoethnographic data recorded throughout the project (including reflective memos, computer code and audio recordings), research themes have surfaced concerning the relationship between the design and usage contexts of my creative practice. Such emergent themes, although emanating from personal practice, subsequently enable an engagement with diverse areas of theory related to human-computer interaction, actor-network theory and science and technology studies. One such theme concerns the dual role played by the performer-developer in such artistic practices. Specifically, I am interested in understanding how as a performer-developer one defines and projects a role for oneself as a performer through the design process, and conversely how, through performance, one defines and refines one's role as a designer.

Scripts and Virtual Users

Akrich and Latour's notion of the script foregrounds the importance of technical objects as mediating forces within interaction, social networks, culture and society [3, 4, 5]. Akrich has defined the development of a *script* as the projection of a virtual user into and through a technical object [3]. According to Akrich, the design process entails a form of inscription and projection of roles for 'virtual users' into the workings of an artefact. An artefact's script is a rich and complex way of understanding both the motivations and domain-specific assumptions of designers in the design process, as well as the way in which real users interact with the affordances expressed through the material agency of the technical object/artefact [4].

I am interested in how we might understand this process of *inscription* for performer-developers that create bespoke and idiosyncratic software artefacts. In such creative contexts we might assume there to be an extremely tight correlation between the real and any projected/virtual user. However, the interaction between a technical design process and a developing performance practice is complex, not least because of the potential for feedback into the design process that real-time performance practice provides.

For the performer-developer, the inevitable cross-pollination between use, design and development aids in the development of what I would describe as a hybrid virtual/real user. This hybrid by definition assimilates new possibilities encountered in the design process at the same time as directly influencing this process through use. The act of developing such artefacts is simultaneously an act of artistic creation, as well as self-development. Artists define themselves and their artistic be-

liefs through the development of the tool itself. In addition, the process of passing over from being a developer to user is a distinct one for the performer-developer – a definitive shift in role that must be acknowledged. Whether testing the artefact in the studio or on stage, performer-developers as users must distance themselves from their own design history, effectively black-boxing the tool in order to navigate the script proposed by the machine itself. This process might be thought of as enabling the performer to suspend disbelief and to succumb to material agency during performance. This is a complex space where material agency interfaces with the history of the designer's decisions in the moment of performance.

Artefacts, Actions and Descriptions

For Hamman [6], there is an important distinction to be made between artefacts/mechanisms that enable music making through use and those that engage a user to contemplate the usage context itself through interaction. In the former, the user employs the artefact as a means towards achieving an outcome, whilst in the latter, the tool itself comes into sharp focus, forcing a consideration and navigation of its affordances. Hamman distinguishes between two overlapping dimensions of human performance in interaction with a mechanism; that of an *action* and a *description*. An *action* is that which 'can affect change within an environment' when coupled with a mechanism. It is made to 'alter the state of the mechanism, and thus its outcome' [6]. A *description*, by contrast, defines how a user understands the relationship between an action and its outcome.

Hamman explains that *descriptions* are formed historically, both culturally and through personal experience. For familiar mechanisms, a user's understanding of action-outcome relationship has been formed prior to an interaction, whether through personal experience or cultural understanding of the mechanism's affordances. For the unfamiliar mechanism, a user's interaction with the mechanism informs the *description* through use. These historically situated understandings of the action-outcome relationship provide the grounds upon which a user understands the outcomes of any interaction.

For the performer-developer creating interactive and autonomous artefacts, this becomes an interesting balancing act. In my creative practice, much of my work involves the development of processes that can provoke or surprise the musician during performance. As such, the relationship between actions and descriptions is not always stable, given the generative nature of the _derivations software (see [2]). By displaying unpredictable behaviour, the performer's *descriptions* of the software are constantly being updated during a performance. Although the performer-developer will retain residual awareness of the internal workings of the artefact, the real-time, performance-specific updates to these *descriptions* are what drive the interaction between player and system on stage.

Discussion

For the performer-developer creating new software artefacts, the process of *inscription* and the forming of *descriptions* is entangled in a web of practice. Despite decisions made in the design process, through prototyping and playtesting the artist develops a working understanding of the affordances of their artefact in performance. The performance itself then becomes a space for interrogating and expanding the historical/cultural frame of development.

Self-reflexivity in this form of practice is crucial to strengthening this two-way relationship. An autoethnographic approach to creative-practice research, drawing upon audio recordings of performances, documented computer code and textual reflections of the development process enables the practitioner-researcher to understand the relationship between design and use in such contexts, and to communicate this knowledge to the community with reference to established theory. Reflecting upon three years of computer code has enabled insight into design decisions that have been directly influenced by my experiences as a performer. By contrast, listening to and reflecting upon recorded performances I am able to trace changes in my behaviour as a performer to previous design decisions, understanding myself as the embodiment of hybrid virtual/real user created through this creative practice.

In my practice, rather than projecting a fixed 'virtual user' through the design scenario, I conceive of the _derivations' development as way to uncover an emergent user through evolving a personal human-machine performance practice. Through testing, performance and refinement, this user comes to reveal itself as part of a performance practice that cannot be separated from the design of my software artefact. It is my belief that by suspending disbelief and engaging with such artefacts as black boxes, performer-developers both engage meaningfully with an artefact's affordances in performance, as well as take their new *descriptions* of these affordances back into an evolving design process. Although the roles of performer and developer remain distinct during performance, it is the temporary black-boxing of an artefact's internal networks that enable both successful performances and further development to occur.

Conclusion

Throughout the life of a research project, research questions and themes often only reveal themselves as a consequence of moves within practice, making the practical domain a space for both generating and responding to research questions. In the context of practice-based digital arts research, examining the relationship between design and use of interactive software artefacts aids in uncovering the complexities of not only novel software artefacts, but also the situated nature of the performance practices that continue to emerge from their development and use. Self-reflective and autoethnographic methods therefore provide useful tools for interrogating emerging practices in the context of established theory, as well as advancing new theoretical understandings.

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